MARBLES.

No.	KIND.	LOCALITY.	Specific Gravity.	Weight of One Cubic Foot.	Ratio of Absorption.	First Appearance of Injury.	Crumbles or Cracks Slightly.	Cracks Badly or Becomes Friable.	Injured so as to be Worthless for a Building.	Melted or Ruined.
						Deg. Fah.	Deg. Fah.	Deg. Fah.	Deg. Fah.	Deg. Fah.
1	Tuckahoe	Westchester Co., N. Y.	2.794	194.6	1+298	900	1000	1200	1200	12[illegible]0
2	Ashley Falls	Ashley Falls, N. Y.	2.742	171.3	1+280	900	1000	1100	1200	1200
3	Snow Flake	Westchester Co., N. Y.	2.848	178.0	1+380	950	950	1000	1200	1200
4	Tennessee	Dougherty's Q'y, E. Tenn	2.711	169.4	1+320	950	950	1000	1200	1200
5	Duke Marble	Near Harper's Ferry, Va.	2.812	175.7	1+340	1000	1000	1100	1200	1200
6	Black Marble	Isle La Motte, Vt.	2.682	176.6	1+320	1000	1000	1100	1200	1200
7	Sutherland Falls	Rutland, Vt.	2 666	166.6	1+342	1000	1000	1100	1200	1200

SLATES.

1	Sabin's Quarry	Montpelier, Vt.	2.869	179.3	1+110	800	850	900	1000	1200

SOAPSTONES.

1	Soapstone	Weathersfield, Vt.	2.668	166.7	1+3 8	1200	----	----	----	----

ARTIFICIAL STONE.

1	Artificial Stone	McMurtire & Chamberlain's patent	2.235	139.7	1+280	750	800	1100	1200	----

MINERAL WAX, A RESUME.

By M. BENJAMIN, PH. B.

Geographical Distribution. Mineral wax or ozocerite (from ὀζειν, to smell, and κηρος, wax) is found in a sandstone in Moldavia, in the vincinity of coal and rock salt. It also occurs in large quantities at Borislav, near Drohobycz, and at Dzwiniacz, near Stainstawow in Galicia, a province of Austria. The mines are situated at the northern foot of the Carpathian Mountains. It has also been found at several other places in the same province. Small quantities have been discovered in England, at Binney Quarry, Linlithgowshire; at the Urpeth Colliery, Newcastle-on-Tyne, and in Wales. In this country it has been found in Texas, in Utah and in California, about fifty miles northeast of Los Angelos, among the Sierra Madre Mountains In Utah the mineral occurs in shale beds, out of which the ozocerite appears as exudations. These shale beds are quite extensive—some forty to sixty miles long by twenty wide, and from seventy to forty feet in thickness. It is thought that by digging and boring the supply of the wax may be increased.

Geologically it is presumed that these beds were formed in a tertiary lake or peat bog. Prof. J. S. Newberry suspects that it will be found to be an evolved product, the distillation of beds of cretaceous lignite and the residue of a petroleum unusually rich in paraffine. The foreign deposits are considered to be about of the same age.

Mode of Occurrence. It is generally found (referring to Galacia) in thin layers and small pieces which must separated from the matrix in which they are found. The smallest pieces are only obtained by a process of washing. It is sometimes found in lumps or layers from one to three feet in thickness, a lump sometimes weighing several hundred weight.

Physical Properties. It is like a resinous wax in consistency and translucency, sometimes with a foliated structure. Its color is brown or brownish yellow by transmitted light and leek green by reflected light. The poorer qualities, which are colored black and are either too soft from abundance of petroleum or too hard (asphalt like in character), are mainly used for the production of paraffin. It possesses a pleasantly aromatic odor. The American variety is described as black in the mass, sections of which are translucent.

Its Chemical Nature. The specific gravity of ozocerite is 0.94 to 0.97. According to Dana it ranges from 0.85 to 0.90.

Its melting point is variously given as follows:

The Moldavian,	84°	Malaguti.
Urpeth mineral,	60°	Johnson.
Galacian,	60°	Höfstadter.
Utah,	61°5	Newberry.
Moldavian,	62°	Schrötter.
From Slanik,	62°	Glocker.
Galacian,	63°	Wagner.

The boiling point is likewise differently given by the authorities:

Urpeth mineral,	121°	Johnson.
Moldavian,	210°	Schrötter.
Moldavian,	300°	Malaguti.
Utah, between	300° and 380°	Newberry.

Concerning this last determination, Dr. S. B. Newberry says; 1.5 grammes of the substance were treated with about 300 c. c. of cold ether, and allowed to stand for twenty-four hours. The substance was decanted through a filter, evaporated, and the resulting mineral tested to obtain the melting point. This treatment gave me a fraction equal to 25.4 per cent. of the original substance, and having a melting point of 49.° C. The residue was again treated with 200 c. c. of cold ether for about the same time, and gave a further product equal to 9.1 per cent. of the original mass, fusing at 61°. On boiling the undissolved portion in about 500 c. c. of ether the whole mass went into solution, and upon evaporation was found to have a fusing point of 67°. It distills without decomposition, is not altered by strong acids, and very little by hot alcohol. The Moldavian variety dissolves but slightly in ether, whereas that found at Urpeth dissolves in this medium to the amount of four-fifths, and separates on evaporation in brown flecks, which melt at 38.°9 to a yellowish brown liquid. The solubility of the variety found in Utah has been sufficiently referred to in the remarks on its fusing point. The composition of ozocerite has been found to be:

	Moldavian.		Urpeth.	Utah.
	Malaguti.	Schrötter.	Johnson.	Newberry.
Carbon	85.75	86.20	86.80	86.15
Hydrogen	15.15	13.77	14.06	13.75
	100.90	99.97	100.86	99.90

It is supposed to be a compound of several members of the paraffine series, which are represented by the general formula $C_n H_{2n+2}$, and perhaps containing certain of the olefines $C_n H_{2n}$, a very full description of the chemical composition of a nodule of ozocerite found at Kinghornness, Scotland, was given in a paper read by W. Ivison Macadam, at the Sheffield meeting of the British Association,* last year.

Process of Manufacture. The crude mineral (ozocerite) is melted with water in order to remove any sand or other earthy impurities with which it is likely to be mixed. It is then run into cakes weighing about two pounds each. Another authority states that crude hydrocarbon is first melted and drawn off; the residue boiled with water, to the surface of which any remaining ozocerite rises; the whole allowed to stand for several hours for any suspended impurities to settle out. The melted wax which was drawn off is poured into moulds, which hold from 100 to 120 pounds. These cakes are then shipped to the various factories in England, Moldavia and Vienna, where it is purified and converted into illuminating oils and paraffine. A portion of it is directly treated on the island of Swatoi Astrow, in the Caspian Sea, near the Peninsula of Apscheron. There it is distilled in flat bottomed iron retorts provided with leaden worms, each of these retorts holding from 1,500 to 2,000 pounds.

Sixty-eight per cent. of distillate is obtained, sixty parts of which are paraffine and eighty parts oil. According to Grabowsky, the products of such a working may be tabulated as:

Benzine	2 to 8	per cent.
Naptha	15 to 20	" "
Paraffine	36 to 50	" "
Heavy lubricating oils	15 to 20	" "
Coke	10 to 20	" "

The oil thus obtained is yellow, opalescent, possesses an ethereal odor, and has a density varying between 0.75 and 0.81. Each distillate yields a quantity of a light oil boiling below 100°, which is used for purifying the paraffine, as will be shown further on. The crude paraffine thus obtained from the first distillation is yellow in color and tolerably pure. It is treated by the hydraulic press and the expressed oil redistilled in order to obtain any remaining paraffine. The pressed paraffine is melted and treated at from 170° to 180° with five per cent. of sulphuric acid, washed, neutralized with lime, and then rapidly distilled, then cast in plaques and again pressed. The cakes thus obtained are treated with twenty-five per cent. of the light oil and again melted and pressed; finally, they are treated with steam for the purpose of eliminating the last traces of essential oil. The material resulting from this treatment is a perfectly pure and colorless substance, free from all odor, transparent, and so hard as to exhibit in large blocks an almost metallic sound.

An improved method of bleaching ceresine, paraffine, petroleum, stearine and other fatty matters has been patented in Germany within a few months. The process consists in heating ozocerite to 170°–200° C. About twenty per cent. of the hydroxides of aluminium, iron, manganese and magnesium or the silicates of aluminium and magnesium are added to the molten mass. The treatment is repeated several times with the clear liquid, which separates upon standing. The residues are then treated with steam to remove ceresine and to restore the hydroxides.

* See *Chemical News*, vol. XI., p. 148.

TEXTILE FABRICS OF THE ANCIENT INHABITANTS OF THE MISSISSIPPI VALLEY.*

By Judge J. G. Henderson.

He showed that the modern Indians and these ancient people are bound together by a similarity in the instruments and processes of spinning and weaving. The materials used were the bark of various trees, the nettle, and the hair of the bear, buffalo, deer and dog. In working up the vegetable substances, the bark was first macerated. After being dried, it was spun in a multitude of ways. The rudest process was rolling on the thigh. The next step was a rude spindle which passed through various processes of evolution to the modern spinning-wheel. The speaker then proceeded to show the gradation of elaboration through which the loom has passed into the process of weaving. Judge Henderson's paper was illustrated by a series of drawings, collection of raw materials, and models of spindles and looms.

OCCURRENCE OF TIN AT WINSLOW, ME.*

By Professor C. H. Hitchcock.

After exhibiting specimens of the ore, etc., which is ordinary tin-stone, and is associated with margarite, fluveite, beryl and arsenical pyrites, Professor Hitchcock observed that there are twelve veins of this ore, in twenty feet of rock, their geological relations being identical with those of the tin veins of Cornwall. A bar of tin weighing fourteen ounces was also shown; it is the largest bar ever made in this country. Professor Hitchcock considers this locality the most promising tin-bearing locality yet discovered in the United States.

MICROSCOPY.

At a meeting of the State Microscopical Society of Illinois, held at Chicago, on the 8th ultimo, a new Microscope stand was exhibited by Mr. W. H. Bullock, specially designed for lithological work.

"The stage was made to rotate concentrically on the same plan adopted in his large instruments, and was graduated to read with a vernier to minutes. Both the minor and sub-stage were mounted on graduated circles, and arranged so as to swing over the stage, either separately or in unison. The sub-stage was made in two cylindrical fittings. The lower one carrying the polarizing prism, could be readily swung to one side, while the upper carried the achromatic condenser. The polarizing prism was mounted with a circle graduated to degrees, and was fitted with a stop for marking the position of the prism. The analyzer was mounted above the objective, somewhat after the manner of a Wenham prism, and could be slid in and out of position with the same facility, and also carried, if desired, a quartz film. It was, he said, a matter of great convenience for the lithologist to be able to pass from the use of ordinary to that of polarized light, without loss of time, and with the instrument on exhibition, this change could be effected in less time than a change of objectives with a double nose piece. The stand was also provided with a goniometer eye-piece, which was fitted with a calc film and and analyzing prism, both separable at pleasure."

The instrument, as above described, appears to be well adapted for the end in view, but we would remind Mr. Bullock that Swift, of London, has arranged the polarizing prism and the analyzer in equally convenient positions for instant use; the former he attached to his patent condenser, under the stage, while the analyzer was fitted exactly as Mr. Bullock described. Such instruments have been made for upwards of ten years, and have been used in this country.

Mr. Beck, of London, who was present, must have been quite familiar with the instrument we have described. We have always found the arrangement to work admirably, and are surprised that makers do not generally adopt the system in all Microscopes.

* Read before the A. A. A. S., Boston, 1880.